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Variation in Emergency Department Crowding During the Competition Hours of a Football Team

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Abstract

Objective: This study aimed to determine if the number of emergency department visits decreased during the matches of a football team in the Turkish Super League.

Materials and Methods: Thirty-eight super league matches of Trabzonspor in the 2021-2022 football season were evaluated. On match days, we recorded the number of patients admitted to the emergency department during a four-hour period, starting one hour before the match and ending one hour after the match. Then, this number of patients was compared with the number of patients in the same time period one day before and one day after the match.

Results: When the number of patients admitted during the match time was compared with the average number of patients admitted on non-match days in the same time period, no statistically significant difference was observed in the weeks with derby matches ($p=0.230$), while the decrease in the number of patients in all other parameters was statistically significant ($p<0.05$).

Conclusion: The statistically significant decrease in the number of patients admitted to the emergency department at the time of a sporting competition compared to other days indicates that some of the admissions to emergency departments on normal days do not include truly urgent cases. In order to improve the quality of health and care services provided to patients with true emergencies, we believe that effective triage of non-emergency cases and various regulations regarding inappropriate use of emergency medicine units would be beneficial.

Keywords: Sport Competition, Emergency Medicine, Triage.

Introduction

Emergency services operate 24/7, providing diagnosis and treatment to all types of critical patients (1). The easy accessibility of emergency services significantly increases the number of non-emergency patients (2). With the number of applications increasing day by day, triage is used to keep the density in the emergency department under control and to distinguish more urgent situations from less urgent situations. Among the patients admitted to the emergency department, The proportion of patients assigned a green triage code, that is, whose condition was not urgent, was found to be 55% (3). In another study, this rate was found to be 79%. The time periods when patients used the emergency department the most were between 16:00-00:00 (4). When the patients admitted to the emergency department are evaluated by age group, the majority are in the young adult group, except for the pediatric and geriatric age group (5). Seasonal changes are also observed in emergency room visits; some studies have shown that the number of non-serious diseases is higher in summer months, while the number of serious clinical conditions, especially those related to chronic respiratory diseases, increases in winter months (5,6). In a study conducted in terms of emergency service utilization, it was shown that the Black Sea Region was the busiest region, and in the same study, it was also observed that the second-tier Ministry of Health Hospitals were the most frequently applied hospitals (3).

In the light of all this information, considering the age groups that use emergency departments intensively, the time periods in which emergency departments are used

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intensively, the proportionally high number of non-emergency cases, and seasonal or climatic changes in the number of admissions, this study aimed to examine whether the number of admissions to emergency departments changes during sport competition hours in a city like Trabzon, where interest in football competitions is known to be different from many other cities.

Materials And Methods

This study evaluated thirty-eight Super League matches of Trabzonspor in the 2021-2022 football season were evaluated. Trabzonspor's other matches other than Super League matches were not included in the study. On the day of the match, the number of patients admitted to the emergency department in a four-hour period covering one hour before the match started and one hour after the match ended was determined. This number of patients was then compared with the number of patients in the same time period one day before and one day after the match. The parameters of whether the match was played in Trabzon or away, whether it was played on weekdays or weekends, whether it was played during the day or at night, whether it was a derby match or not were recorded with the data collection form prepared in advance. Matches played before 19:00 are considered day matches and matches played after 19:00 are considered night matches. Matches against Galatasaray, Fenerbahce and Besiktas are recorded as derby matches. Match data was obtained from the official website of the Turkish Football Federation. Patient data were obtained through the hospital HIS system and all patients who applied to the emergency department of Akçaabat Haçkalıbaba State Hospital during the mentioned time periods were included in the study.

Data normality was assessed using histograms, Q-Q plots, and the Shapiro-Wilk test. Independent two sample t test was used for comparisons between paired groups. The relationship between quantitative data was evaluated by Pearson correlation analysis. Data were analyzed using R 4.0.3(www.r-project.org) software. Significance level was accepted as $p<0.05$.

Ethical Committee

Approval was obtained from Erzincan Binali Yıldırım University Faculty of Medicine Ethics Committee for our study (Ethics Committee Decision Date: 07.03.2024 / decision no: 2024-03/08).

Results

The number of patients admitted at match time and the average number of patients admitted on non-match days are given in Table 1. During the thirty-eight weeks, the average number of patients admitted at match time was 81.44 and the average number of patients admitted non-match days was 92.03. The highest number of patient admissions at match time was observed in the fourth week and the lowest number of patient admissions in the thirtieth week.

Upon analyzing the matches, it was found that, it was determined that the proportion of home and away matches was the same. While the rate of weekend matches was 65.8%, the rate of night matches was 68.4%. A total of six derby matches were played during the season and these matches accounted for 15.8% of all matches (Table 2).

When the number of patients admitted at match time was analyzed, it was observed that there was no statistically significant difference when the match was home or away, the match day was weekday or weekend, the match time was day or night, and the match was derby or not (Table 2).

When comparing the mean number of patients admitted on the days before and after the match was analyzed, it was observed that there was no statistically significant difference between whether the match was home or away, whether the match day was weekday or weekend, whether the match time was day or night, and whether the match was derby or not (Table 2).

When the number of patients admitted at the time of the match was compared with the average number of patients admitted on non-match days in the same time period, no statistically significant difference was observed in the weeks with derby matches ($p=0.230$), whereas the decrease in the number of patients in all other parameters was found to be statistically significant ($p<0.05$) (Table 3).

Discussion

Emergency departments provide health services to all patients who apply without any criteria, categorize patients according to their urgency, and work on a 24/7 basis (7). In our country, the diagnosis and treatment processes of a significant portion of the patient population are carried out in emergency departments (8). According to the social security institution, the concept of emergency is defined as "sudden illness, accident, injury and similar situations that require medical intervention within the first 24 hours following the occurrence of the event, and situations where it is accepted that the risk of loss of life and / or health integrity will arise if urgent intervention is not made and transferred to another health institution." However, in our country, especially in recent years, emergency services have not been used in accordance with their purpose (9). In a study by Simsek et al. more than half of the

Table 1. Comparison of the mean number of patients admitted during match hours and non-match days

Competition week	Number of patients at match time	1 day before the match number of patients in the same hour	1 day after the match number of patients in the same hour	Mean number of non-match days
1	111	106	100	103
2	105	145	131	138
3	97	120	105	112.5
4	125	101	105	103
5	70	96	112	104
6	95	90	102	96
7	94	94	72	83
8	84	101	77	89
9	74	90	90	90
10	87	87	93	90
11	65	88	80	84
12	72	109	102	105.5
13	73	76	86	81
14	79	69	92	80.5
15	69	102	101	101.5
16	99	91	100	95.5
17	86	100	82	91
18	67	93	50	71.5
19	90	68	86	77
20	95	104	121	112.5
21	89	116	80	98
22	72	93	67	80
23	82	103	85	94
24	62	83	75	79
25	57	87	91	89
26	64	78	87	82.5
27	71	89	82	85.5
28	70	67	75	71
29	73	55	58	56.5
30	52	60	57	58.5
31	104	138	120	129
32	87	104	121	112.5
33	84	98	93	95.5
34	69	87	104	95.5
35	65	79	96	87.5
36	94	94	87	90.5
37	84	85	101	93
38	79	85	98	91.5
Mean	**81.44**	**92.92**	**91.15**	**92.03**

patients admitted to the emergency department according to the triage application were evaluated as code green, which is the least urgent condition. Patients in the code green category are the patients who are intervened in the emergency department within two hours at the latest (3).

In our study, there was a decrease in the number of patients admitted to the emergency department at the time of a football match compared to the day before and the day after. While there was no statistically significant difference in the weeks with derby matches ($p=0.230$), the decrease in the number of patients in all other parameters was statistically significant ($p<0.05$). On the other hand, when the whole season was evaluated together, when the total number of patients admitted at match time was compared with the average number of patients admitted on non-match days, a statistically significant decrease was observed on non-match days ($p<0.05$). Although it was observed that the number of patients decreased numerically on the days of derby matches as on all other days, the reason for the lack of statistical significance

Table 2. Comparison of the number of patients on match day and non-match days with match variables

Variables of Matches	n (%)	Number of patients at match time	*p*	Mean number of patients on non-match days	*p*
Field situation					
Home	19(50)	81.47±17.44	0.992	92.42±18.66	0.888
Away	19(50)	81.42±14.51		91.66±14.12	
Match day					
Weekdays	13(34.2)	82.92±17.57	0.684	90.69±19.71	0.719
Weekend	25(65.8)	80.68±15.16		92.74±14.67	
Match time					
Day	12(31.6)	81.00±13.90	0.908	92.42±8.57	0.924
Night	26(68.4)	81.65±16.89		91.87±19.03	
Derby match					
Yes	6(15.8)	87.83±22.08	0.288	98.75±19.22	0.278
No	32(84.2)	80.25±14.52		90.78±15.75	

may be that the number of derby matches was limited to six weeks. This patient population, which decreases during match hours, is thought to be patients outside of real emergencies.

In the study conducted by Sert et al. the most frequently used time periods in the emergency department were between 16:00 and 00:00. This was interpreted as people coming to the hospital after work, suggesting that their illnesses were not real emergencies and could be postponed in time (4). In our study, the fact that the number of patient admissions decreased on all match days, regardless of the time of the day, supports the fact that people may postpone their visits to the emergency department due to illness for various reasons.

In the study by Köse et al. the age range of 77% of the patients admitted to the emergency department was 17-65 years (10). Considering that the age group that closely follows football matches in our country is also in this group, the decrease in the number of patients during match hours in our study may be associated with this situation.

In the study by Sert et al. and the study by Aslan et al. it was observed that more than half of the patients admitted to the emergency department were male (4,5). Considering that football matches are followed more by men than women, the decrease in the number of emergency room visits during match hours can be considered significant in this context.

The fact that our study was conducted in a single center and on the matches of only one football team can be shown as a limitation.

The significant decrease in the number of patients admitted during football matches compared to other days indicates that some of the admissions to emergency departments on normal days do not include truly urgent cases. Given the increasing number of ED visits is increasing day by day, we think that it would be beneficial to make various regulations regarding the inappropriate use of emergency departments by non-emergency cases in order to increase the quality of health and care services provided to patients with real emergencies.

Table 3. Statistical comparison of the number of patients admitted on match days and non-match days according to match variables

Variables	Mean Number of Patients on Non-Match Days	Number of Patients at Match Time	*p*
Field situation			
Home	92.42±18.66	81.47±17.44	**0.009**
Away	91.66±14.12	81.42±14.51	**0.002**
Match day			
Weekdays	90.69±19.71	82.92±17.57	**0.037**
Weekend	92.74±14.67	80.68±15.16	**0.001**
Match time			
Day	92.42±8.57	81.00±13.90	**0.009**
Night	91.87±19.03	81.65±16.89	**0.002**
Derby match			
Yes	98.75±19.22	87.83±22.08	0.230
No	90.78±15.75	80.25±14.52	**0.001**

Conclusion

As in our study, more comprehensive studies can be conducted to determine whether there is a change in the number of patients admitted to emergency departments during the hours of sports competitions or television programs that appeal to a large majority of the society on a local or national basis. In this way, new reforms can be made on how to provide more effective and quality health services by determining whether emergency medicine are used for their intended purpose.

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